DOCUMENT RESUME

ED 326 299 PS 018 560

AUTHOR Rogers, Jean G.; Webster, Raymond E.
TITLE A Research Review of Early Identification of At-Risk Learners.
PUB DATE 87
NOTE 23p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *At Risk Persons; Comparative Analysis; *Disabilities; Early Childhood Education; *Identification; Parent Influence; Predictor Variables; Racial Differences; *Screening Tests; Sex Differences; *Socioeconomic Background; Socioeconomic Status; Young Children

ABSTRACT

A review of nine major studies of preschoolers compares the predictive validity of achievement and psychoeducational tests in the identification of at-risk learners with the predictive validity of socioeconomic information. Findings indicate that tests used for special education identification have only a slightly better than chance prediction rate. More reliable predictors of school success are the race and educational status of the mother, the gender of the child, and the socioeconomic background of mother and child. The studies indicate that no test instruments can predict at-risk learners at an early age better than chance. Observations of children's abilities to follow direction, attend to tasks, visually and sequentially organize tasks, and systematically approach tasks may be the best indicators of early school success and failure. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED326299

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

A Research Review of Early Identification of At-Risk Learners

Jean G. Rogers

Martin County Board of Education

Williamston, NC 27892

Raymond E. Webster

Department of Psychology

East Carolina University

Greenville, NC 27858-4353

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Jean G. Rogers

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PS 018560

[1] Requests for reprints of "Review of Early Identification of At-Risk Learners" should be sent to Jean G. Rogers, 908 Woodlawn Drive, Williamston, NC 27892 (919-792-4245).

A Research Review of Early Identification of

At-Risk Learners

ABSTRACT

A comprehensive review of the literature of nine major preschool studies compares the predictive validity of achievement and psychoeducational tests with socio-economic information to identify at-risk learners. The tests used for special education identification have only a slightly better than chance prediction rate. More reliable predictors of school success are the race and educational status of the mother, the gender of the child, and their socio-economic background. These studies indicate that there are no test instruments which can predict at-risk learners at an early age better than chance.

A Research Review of Early Identification of

At-Risk Learners

Large numbers of children experience academic failure during the first three years of their school careers. The more severely and obviously disabled youngsters may meet state department criteria to receive special education services after they fail. Those children with less severe handicapping conditions who do not meet special eligibility criteria may be overlooked and receive no services even when they have encountered repeated academic failure (Lichtenstein, 1982; Algozzine & Ysseldyke, 1983).

Since school failure often promotes low self-esteem, poor academic achievement and conduct/behavior problems, it is essential that the predisposing and/or learning characteristics of children who are likely to fail be empirically identified. These characteristics must be identified as early as possible during their educational experience so that interventions can be implemented in an attempt to change the course of failure oriented situations and/or conditions.

The research reviewed in this article focuses on early identification of at-risk learners as related to pre-school age children and school-age children. A review and analysis of previous research examining the utility of a variety of psychological and social variables evaluated to identify and predict at-risk learners early in their school career is presented.

With a focus on the whole-child, the Carolina Abercedarian Project (1972) was initiated to determine whether systematic early educational interventions could prevent retarded intellectual development in children from families with a high-risk for school failure. Secondary foci of the Project were to determine if a follow-through program for early elementary school was necessary to maintain any pre-school intellectual gains and if school-age intervention alone significantly improved academic and/or intellectual performance in children who did not have a preschool intervention experience. In addition, the effect of time to implement compensatory intervention on school retention was considered.

The Project identified 109 families with 111 children who qualified according to the High Risk Index. This Index rated families according to the level of parental education and income. The story of mild retardation or school failures in family members, and other evidence of family-based psychopathology or social maladaptive behaviors. Fifty-seven participants were randomly assigned to the educational treatment group and 54 to the control group. Children assigned to the educational treatment group began formal daycare as early as six weeks of age. A teacher-student ratio of 1:3 in the nursery was continued until age four years, when it increased to 1:6. The curriculum consisted of enrichment activities in language, motor, communication, social, and cognitive skills development. Nutritional and medical enrichment was also provided to families.

Intensive in-service training was given to teachers. Teacher responsibilities involved community involvement and family counseling along with more typical instructional duties.

The variables studied were preschool educational treatment versus no preschool treatment, and school-age educational treatment versus no school-age treatment. There were two preschool groups, the experimental (E) and control (C) groups, and four school-age conditions: preschool experimental with school-age experimental (EE), preschool experimental with school age control (EC), preschool control with school-age control (CE) and the pre-school control with school-age control (CC). These groups varied in the intensity (defined as number of years) of intervention: 8 years for EE, 5 years for EC, 3 years for CE, and none for the CC group.

In the preschool program, children in both groups were given standardized intelligence tests annually during their first 54 months of participation. The Stanford-Binet was administered through age three and the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) was given up to age five to both the Experimental (E) group and the Control (C) groups. At one year the E group had an IQ mean of 111 and at 2 years it measured 96, a decrease of 15 points. The C group at one year was 105 and at 2 years it measured 85, a decrease of 20 points. At 3 years of age the E group mean IQ score was 101, and the C group IQ mean was 84, a 17 point difference between the two groups. The WPPSI, which was given at age 5, yielded a E group IQ mean of 101

and the C group IQ mean of 94, a difference of 7 points. This difference diminished to some degree which may have been attributable to differences in the measuring instruments (Bryant & Ramey, 1987).

The school-age intervention program began at kindergarten entry and concluded at the end of second grade. A home/school resource teacher was provided for each child with the preschool experimental and school-age experimental (EE) and with the preschool control and school-age experimental (CE) group. The preschool experimental and school-age control (EC) and the preschool control and school-age control (CC) did not have home/school resource teachers. The roles of these teachers were curriculum developers; teaching parents how to help their children; tutoring the children directly; meeting regularly with classroom teachers; serving as consultant for the teacher when problems arose; and advocating for the children and parent within the school and community. Their purpose was to facilitate communication between teacher and parent and provide support for the families. Each home/school resource teacher had a caseload of approximately 12 families per year. Supplemental curriculum concentrated on the basic subjects of reading and mathematics. summer experiences of camping, trips to the library and tutoring were provided. (Ramey & Campbell, 1984).

A repeated measure/analysis of covariance with age as the covariate was employed to determine whether the four school-age treatment groups' mean scholastic performance differed, as

measured by total raw score on the spring administration of the PIAT. Group membership was found to be significantly associated with academic achievement. A Dunnett's contrast was used to compare each treatment group's mean with the control group's (CC) mean. The contrasts showed that after 2 years the EE and EC groups' means were higher than that of the CC group, but that the CE group did not differ significantly from the CC group. Thus, it appears that preschool treatment status did affect the level of academic outcomes, but the school-age treatment status did not, at least during the first 2 years of the program. It also appears that through the second year of school the rate of gain was maintained.

At the end of second grade, between group comparisons of academic achievement and grade retention were made. The experimental pre-school children began school nearly one standard deviation above that of the control groups. This is the authors general assertion, but the actual between-point difference on the Stanford-Binet at the kindergarten entry was seven points. After two years in public school all groups made similar achievement gains. However, the authors maintain that achievement by the EE group was greater based on the test performance on the PIAT in the first and second grades. The graph designating the group was about 115; the CE group was about 118; and the CC group was about 110. The between-group differences according to these results are questionable (Bryant & Ramey, 1987).

In their research, Bryant and Ramey (1987) found preschool

interventions begun at ages 3 and 4 to impact intelligence test measurements made at age 5. These data offer some support for a four year kindergarten program such as that presently being considered in North Carolina.

Comparisons with rates of retention in school were made using the overall North Carolina retention rate of 16% as the standard for group measurements. Twelve percent of the EE children were retained compared to 25% of the EC group, 38% of the CE group, and 32% of the CC group. These findings suggest that children with intensive, whole-family pre-school and in-school interventions maintain somewhat better school performance with fewer number of grade retentions for school failure at least through second grade (Ramey & Campbell, 1984).

Smaller teacher-student ratios, supplemental nutritional and medical care, intensive curriculum focus and emotional and community counseling, require immense costs for staffing and materials. Since these educational interventions began shortly following birth and involve more family-oriented services than regular education, the overall cost would be more than twice that of regular education. Considering the needs of all children, it is necessary to be realistic about whether such a program is cost-efficient and practical for approximately 16% of the total school-age population.

The Minneapolis Preschool Screening Instrument (MPSI) (Lichtenstein, 1982) was developed to try to minimize identification errors in the mass screening of students who may

need to be referred for psychoeducational problems. Mardell and Goldenberg (1975) compared the MPSI and the Developmental Indicators for the Assessment of Learning (DIAL) as screening instruments to identify children who have problems in kindergarten and first grade. Children were concurrently administered the DIAL and the MPSI and were rated by their kindergarten teachers on a follow-up questionnaire during the spring of the following year. The sample consisted of 428 children ages 49 to 64 months and included 13.5% minority children.

The follow-up criterion measure was derived by summing teacher ratings in nine areas: learning habits, reading readiness, speech, gross motor, social-emotional development, pre-academic skills, language development, fine motor/perceptual motor and overall readiness for first grade. Children were classified into one of three groups: moderate to severe problems (6.8%), mild problems (8.4%), and no significant problems (84.8%). The MPSI accurately identified 86.2% of the children with moderate to severe problems, while 72.4% of this group had a DIAL outcome of "re-DIAL" or refer.

In predicting academic ability, the MPSI had distinctly higher accuracy rates than the DIAL. Although the psychometric data are encouraging, the MPSI still failed to identify all children rated as having severe to moderate problems in kindergarten and first grade and missed an even greater proportion of children with only mild problems.

A comprehensive review of literature revealed 11 follow-up studies that presented prediction accuracy rates for identification decisions made at kindergarten level or earlier (Lichtenstein, 1980b). The results from six studies in which decision rules were established prior to the study (i.e., in an unbiased manner) revealed no instance in which over half of the identified children were in the at-risk group upon follow-up and over half of the follow-up at-risk group were identified in advance. The criterion was met, however, by the MPSI predictive validity study. No consistent relationship between duration and comprehensiveness of measures and accuracy of measures was noted for the prediction studies reviewed. These data indicate that direct assessment of the preschool child quickly reaches the point of diminishing returns as far as predictive accuracy is concerned. Apparently, extensive assessment of young children at a single point in time to determine those likely to fail is a poor investment, both statistically and financially (Lichtenstein, 1982).

The identification of children with mild to moderate problems who are generally not identified before failure was studied by Colarusso, Gill, Plankenhorn & Brooks (1980). They screened 40, five-year old black children participating in Headstart programs in Atlanta to determine the value of formal achievement testing to predict later success in school. At the beginning of their kindergarten year, each child was tested using a battery of subtests that consisted of the Developmental Test of

Visual Motor Integration Skills (VMI), Motor-Free Visual Perception Test (MFVP), Slosson Intelligence Test (SIT), the Peabody Picture Vocabulary Test (PPVT), and selected subtests from the Illinois Test of Psycholinguistic Abilities (ITPA), including Auditory Reception (AR), Auditory Sequential Memory (AM), Verbal Expression (VE), and Grammatic Closure (GC).

These children participated in regular elementary school experiences and testing programs offered. Comparisons were made between the preschool testing and the school testing to validate whether success in school could be predicted. In April of their first grade year they were given the Iowa Test of Basic Skills (ITBS). Level seven of the ITBS is composed of six subtests: Vocabulary, Word Analysis, Reading Comprehension, Spelling, Math Concepts and Math Problem Solving. For follow-up purposes, these variables were measured: Reading (which consisted of the Reading Comprehension subtest), Math (which was composed of the mean of the Math Concepts and Math Problem-Solving subtests), and Total composite (which was composed of the mean of all six subtest scores).

Statistical analysis of performance on the Reading and Math Composite scores from the ITBS with the predictor variables (chronological age, sex, and test scores from the MVPT, AR, VE, GC, AM, PPVT, and SIT) showed only two significant correlations. The AM subtest of the ITPA significantly predicted the Math variable and the MVPT was significant with the Total Composite score. It was hypothesized that the child receives number

information auditorily, stores it, and then repeats it. This relates to the skills required for attention and following directions which is primary in learning. The correlation between the MVPT with the Total Composite was interpreted to reflect the child's abilities to attend, follow an orderly sequencing pattern on task attack skills, and to store information. These two correlations are of interest in the processing of information related to the transfer and retention of information. However, the actual value of these tests to predict academic success was quite limited (Colarusso, Gill, Plankenhorn & Brooks, 1980). Moreover, the authors fail to address the fact that it is highly likely that the two significant correlations found may have resulted from random and error factors associated with generating a matrix based on such a large number of bivariant pairings.

In Minnesota during 1982-83, a statewide health and developmental pre-school program screened 45,457 preschool children, which comprised 96.7% of the total number of pre-schoolers in the state at that time (Ysseldyke & O'Sullivan, 1987). Basic information about each youngster was obtained from forms submitted to departments in these areas: height, weight, vision, hearing, fine motor development, gross motor development, speech/language development, and cognitive development.

Two studies were conducted to investigate factors related with the early identification of at-risk learners. These studies addressed three research questions: (a) Can group membership in screening programs with high versus lowreferral rates be

predicted accurately from demographic and educational characteristics of the school districts?; (b) How strong is the relationship between preschool screening referral rates and the demographic/educational characteristics of the districts?; and (c) Are some predictor variables better than others in predicting preschool screening outcomes?

Social, economic, and educational variables used to predict high versus low referral school students were selected from data sources that describe Minnesota's 48 district profiles. A total of 24 variables, 38 school district profile variables, and 134 census variables were considered. From this data set a factor analysis was used to reduce the 62 child and school variables to 24. Factor scores for each school district were computed and entered as predictors in a discriminant function analysis. To help clarify the dimensions related to high-referral and low-referral districts the factors were: first, socio-economic status; second, school district size; third, minority-federal revenue (rated negatively); fourth, school expenses (rated negatively) and fifth, local revenue. A stepwise discriminant function analysis was based on randomly selected districts (25 low-referral and 21 high-referral). None of the predictor variables individually or combined predicted better than change. The lack of predictive power also was reflected by the finding of only 2 of 62 possible significant Pearson Correlations between potential predictor variables and referral rates, when three significant correlations can be expected by chance alone

(Ysseldyke & O'Sullivan, 1987)!

These results imply that membership in the low socio-economic or lesser educated group did not correlate with a higher referral rate in that particular school district. With other combinations of global demographic/educational variables in a second study, there was no significant contribution to the prediction of referral rates in the statewide program. Both studies clearly show that preschool referral for special education and membership in groups of high-referral versus low-referral groups were not related to broad social, economic and educational factors in any simple way. A flip of a coin could have predicted group membership with comparable accuracy.

These findings show that local screening practices, purposed, definitions of referral and diagnostic assessment need to be examined more closely. Apparently, screening for referral means something different from the usual definition of referral leading to diagnostic assessment. It is also probable that screening programs differ markedly in their purposes, their relatedness with other service providers, and in their attitudes about handicapped children and special education programs (Ysseldyke & O'Sullivan, 1987).

Ramey, Stedman, Borders-Patterson and Mangel (1978) collected information from birth certificates in an attempt to identify children most likely to need special education services during first grade. Approximately 1,000 randomly sampled first grade children were chosen from 20 counties in North Carolina.

Fifty children from each of the 20 counties were identified. Twenty field evaluators were trained to administer the PPVT, the Berry Buktenica Development Test of Visual-Motor Integration (VMI), the Test of Basic Experiences, and the Myklebust Pupil Rating Scale.

These instruments were used to define the child's present functioning level in the areas of verbal intelligence, accumulated experiential information, visual motor integration and personal-social behaviors. The child's educational status was defined as the relative standing on educational norm-referenced measures as compared with other children of similar age or grade level.

For the purposes of this study, psychological and educational performance measures were considered as outcome or criterion variables. Test performance was to be predicted from information obtained from the children's birth certificates: race, sex, birth order, birth, weight, number of weeks gestation, and legitimacy. The same source provided the following information about the mother: age, educational level, the month prenatal care began, and whether there were previous live births now deceased or a history of miscarriages.

Step-wise multiple regression analyses were conducted using demographic data as predictors for performance in each of the four psychological and educational domains. The multiple regression analysis with PPVT performance as the criterion indicated that race and education of the mother were the most

important predictors with a multiple correlation of .52 obtained. All other variables accounted for less than one percent of the unexplained variance. In predicting the visual-motor integration age equivalent, the two variables that entered significantly were race of the child and education of the mother with a multiple correlation of .36. For teacher's ratings, race and education of the mother yielded a .54 multiple correlation (Ramey, Stedman, Borders-Patterson & Mangel, 1978). Even though these coefficients are statistically significant, the findings really point out the difficulty of using demographic variables to predict school failure on at-risk-to-fail children.

Characteristics with the highest correlations with test performance were mother's race and educational level. The more severely disabled at-risk children tended to be black and illegitimate. These findings demonstrate that it is possible to identify a limited number of children at birth who, for socio-cultural reasons, are more likely to need special services before or during grade school.

In Burlington, North Carolina (Vacc, Vacc, & Fogleman, 1987), 245 pre-kindergarten children were screened four months before entering school with the DIAL. The DIAL assesses gross motor (throw, catch, jump, hop, skip, stand still, and walk a balance beam); fine motor (match designs, build block designs from a model, cut patterns, copy geometric designs, copy letters, repeat a finger-touching pattern, and repeat a hand-clapping pattern); concepts (a child's ability to sort objects, identify

colors, count by rote, identify positions, follow verbal directions, identify body parts, and identify concepts, e.g., big/little); and communication skills (articulate selected words, repeat a series of numbers and a series of sentences, name nouns and verbs, solve coping problems, name self, age, and sex, classify foods, and tell a story). The effectiveness in predicting school success was determined by first-grade performance on the California Achievement Test. Results from multiple regression analyses showed socioeconomic status to be a better indicator of success in reading, language, and mathematics than performance on any of the DIAL subtests.

A longitudinal study of a kindergarten screening battery to predict reading comprehension for children up to five years after entering school was conducted by Kilgallon and Mueller (1986). The battery consisted of the Otis-Lennon Mental Ability Test; Bender Visual Motor Gestalt Test; Detroit Test of Learning Aptitude (DTLA) Visual Attention Span for Objects; DTLA Auditory Attention Span for Unrelated Words; Elenbogen Test of Auditory Discrimination; Word Recognition; Word Reproduction; Wide Range Achievement Test (WRAT) reading achievement; and WRAT arithmetic achievement. Test scores were compared with reading comprehension measures using performance on the Stanford Achievement Test (SAT). From 1978 through 1982 the SAT was administered annually to students. Regression analyses were performed at each grade level by gender. At all grade levels except fourth, gender was a better predictor of reading

achievement than any test variable (Vacc, Vacc & Fogleman, 1987)!

A comprehensive review of the literature of nine major preschool studies compared the predictive validity of achievement and psychoeducational tests with socio-economic information to identify at-risk learners. The tests used for special education identification have only a slightly better than chance prediction rate. With this only slightly better than chance prediction rate, consideration needs to be given to those children who fail to qualify for placement in special programs, such as the low achiever or slow learner. These are the children who fail because they are not sufficiently impaired to qualify for special educational service that provide specialized, individual help.

Even though results are encouraging, the small number of children given services and the extremely expensive cost of the whole-child family intervention concept make this approach unrealistic. Further, the staff training requirements and on-the-job demands are well beyond those expected from most teaching personnel.

Since information acquired from birth certificates and socio-economic data are better predictors of at-risk learners than most achievement test data, it appears impractical and unnecessary to spend time, effort, and money to conduct psychoeducational norm-referenced testing. More reliable predictors of school success are the race and educational status of the mother, the gender of the child, and their socio-economic background.

These studies indicate that there are no test instruments which can predict at-risk learners at an early age better than chance. Observations of children's aptness to perform such skills as following directions, attending to tasks and the ability to visually and sequentially organize and systematically approach tasks may be the best indicator of early school success and failure (Lichtenstein & Ireton, 1984; Webster & Schenck, 1979).

References

Algozzine, B. & Ysseldyke, J. (1983). Learning disabilities as a subtest of school failure: the over-sophistication of a concept. Exceptional Children. 50(3), 242-246.

Bryant, D. & Ramey, C. (1987). An analysis of the effectiveness of early intervention programs for environmentally at-risk children. The Effectiveness of Early Intervention for At-Risk Children and Handicapped Children. Frank Porter Graham Center: Academic Press, Inc.

Colarusso, R., Gill, S., Plankenhorn, A., & Brooks, R. (1980). Predicting first-grade achievement through formal testing of 5-year-old high-risk children. The Journal of Special Education. 14(3), 356-361. York: McGraw-Hill Book Co.

Kilgallon, M. & Mueller, R. (1986). A longitudinal study of predictive validity of a kindergarten screening battery. Dekalb, Ill.: Northern Illinois University. (ERIC Documentation Reproduction Service. Ed. 276756).

Lichtenstein, R. (1982). New instrument, old problem for early identification. Exceptional Children. 49(5), 70- 72.

Lichtenstein, R. & Ireton, J. (1984). Preschool

Screening: Identifying Young Children with Developmental and Educational Problems. New York: Grune & Stratton.

Ramey, C., Bryant, D. & Suarez, T. (1985). Preschool compensatory education and the modifiability of intelligence: a critical review. Current Topics in Human Intelligence. 10. Norwood, N. J.: Ablex Publishing Corp.

Ramey, C. & Campbell, F. (1984). Preventive education for high-risk children: cognitive consequences of the carolina abecedarian project. American Journal of Mental Deficiency. 88(5), 515-523.

Ramey, C., Stedman, D., Borders-Patterson, A., & Mangel, W. (1978). Predicting school failure from information available at birth. American Journal of Mental Deficiency. 82, 525-532.

Vacc, A., Vacc, N., & Fogleman, M. (1987). Preschool screening: using the dial as a predictor of first-grade performance. Journal of School Psychology. 25, 45-51.

Webster, R. & Schenck, S. (1979). Diagnostic test pattern differences among ld, ed, emh, and multi-handicapped students. Journal of Educational Research. 72, 75-80.

Ysseldyke, J. & O'Sullivan, P. (1987). Predicting

preschool screening referral rates from district demographic data. Journal of School Psychology. 27, 119-129.

Zigler, E. & Seitz, V. (1980). Early childhood interaction programs revisited. School Psychology Review. 9, 354-368.

END

U.S. Dept. of Education

Office of Education
Research and
Improvement (OERI)

ERIC

Date Filmed

March 29, 1991